

RCRA Compliance Evaluation Inspection [CEI] at:¹

Metalor [a.k.a. Metalor Technology U.S.A. Refining Division]

Facility Location: 255 John L. Dietsch Blvd., North Attleborough, MA 02761
Phone: 508-699-8800
fax: 508-695-1603
website: www.metalor.ch

EPA Generator Identification Number: MAD128422870

Generator Status: Federal Conditionally Exempt Small Quantity Generator [CESQG];
State Very Small Quantity Generator [VSQG]

Date of Inspection: July 28, 2005
arrival: 10:05 a.m.
departure: 3:33 p.m.

EPA Inspectors: Susann Nachmann, Environmental Engineer
Lisa Papetti, Environmental Engineer.
[EPA credentials were presented upon entering the facility.]

Facility Contacts:

David J. Kinneberg, Vice President, Production
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Principle Facility Tour Contact

Chuck Tatakis, Environmental Health and Safety Coordinator and Project Engineer ²
[same address and fax]
508-699-8800, ext. 224

State Coordination:

On July 20, 2005, EPA contacted the Massachusetts Department of Environmental Protection [MADEP] about EPA's intention to conduct this inspection on July 28th. MADEP indicated that this facility had undergone a state multimedia inspection on September 22, 2003. No state enforcement action resulted from this inspection.

¹ This inspection was conducted by EPA Region I as part of EPA's National Mineral Processing Initiative.

² Mr. Tatakis is also the Environmental Health and Safety Coordinator for Metalor Technologies U.S.A., located at 52 Gardner Street, Attleboro, MA [EPA Generator Number: MAD041172719; status: large quantity generator]. This facility was not inspected by EPA on July 28th.

BACKGROUND INFORMATION and OPENING CONFERENCE [10:05 a.m. to 11:00 a.m.:

- Employees: ~ 90-100
- Primary SIC: Primary Metal Products.
- Primary NAICS: Primary Smelting and Refining of Non-ferrous Metals (except Copper and Aluminum).
- Description: Manufacturing: Facility provides precious metal refining services. Products include gold and silver salts, cyanide salts, gold and silver bullion, small amounts of osmium. [Platinum and palladium are only traded, not refined.]

- **Attachment I** of this report corresponds to Metalor's web-page description of the facility's process. Basically, "[t]he Metalor Technologies Group, based in Neuchatel in Switzerland with subsidiaries in 15 countries over the world, is active in the field of precious metals processing and advanced materials...[and]...is specialized in the evaluation and refining of precious metals (gold, silver, platinum and palladium) of both primary and secondary in origin. [Metalor's Refining Division] refines materials containing precious metals, such as..... industrial scraps, workshop wastes,..... or any other type of substance containing precious metals, as long as recycling is economically worthwhile."

"[M]aterials [metal alloys] containing a relatively high percentage of gold [silver and copper] undergo pre-refining by chlorination in the Miller Furnace. This pyro-metallurgical procedure preforms the initial separation of gold, silver and copper. The resulting gold is processed further in electrolytic cells. Silver and copper, in the form of Miller slag, [are] sent to the silver circuit for treatment." Basically, the chlorine in the Miller Furnace reacts with everything in the pot at different rates. Gold is one of the last elements to react with chlorine, consequently, silver and copper bearing slag can be separated from the gold. Additional treatment of the silver/copper slag will separate out these elements. Further refinement of gold and silver takes place in electroplating cells. Some resultant products are gold and silver bullion [e.g., 99% pure silver bars]. The remaining copper hydroxide powder is sent to an off-site copper recycler.

- The most recent Hazardous Waste Generator Notification, dated June 20, 2002, indicates that the following waste streams are generated at Metalor: D002 [corrosive], D003 [reactive], F007 [spent cyanide plating bath solution], F008 [plating bath residues from the bottom of plating baths], F009 [spent stripping and cleaning bath solutions], F010 [quenching bath residues from oil bath from metal heat treating operations], F011 [spent cyanide solutions from salt bath pot cleaning from metal heat treating operations], F012 [quenching wastewater treatment sludges from metal heat treating operations], and P030 [soluble cyanide salts].

According to Mr. Tatakis, these wastes are not manifested off-site as hazardous waste since they are precious metal bearing and are, therefore, treated to recover the metals. The facility's processing of these materials does result in a wastewater discharge covered under a Clean Water Act [CWA] Industrial Pretreatment User Permit issued by the North Attleborough Publically Owned Treatment Works [POTW], included as **Attachment II** to this report. Contaminants in the wastewater are trace amounts of lead, zinc, tin, cadmium and selenium. Mr. Tatakis further stated that the POTW Pretreatment Coordinator [Mr. Thomas Houle] frequently inspects Metalor's industrial pretreatment wastewater treatment facility [WWTF] for compliance with its IU permit conditions.

Mr. Tatakis stated that materials which are shipped off-site correspond to “sweeps”³ and sludges that contain less than 2-3% gold or other precious metals, since it is not cost effective to refine these materials at Metalor. Consequently, they are sent off-site to reclaimers in Italy or Canada for precious metal recovery. These materials are not sent off-site as a hazardous waste since they are reclaimed to recover economically significant amounts of precious metals [see 40.C.F.R. 266 Subpart F].

Additionally, materials that are manifested off-site as hazardous waste generally correspond to chemical inventory clean-outs of the Facility’s Gold Product Laboratory, which correspond to such items as expired reference solutions, reagents and chemicals. Laboratory inventories are reviewed once every 18 months. E.Q. Northeast of Wrentham, Massachusetts serves as Metalor’s environmental consultant during these clean-outs.

Regarding the P030 [soluble cyanide salts] described on the generator notification, Mr. Tatakis said that Metalor rarely takes in cyanide solutions for refining, and that he has not seen any manifested shipments of P030 wastes in his tenure at Metalor.

- ➔ **Attachment III** provides copies of Metalor’s two-story floor plan.
- ➔ **Attachment IV** provides a copy of a June 12, 2004 Bill of Lading (and related exchanges of documents) for a single shipment of Metalor’s discarded sweeps sent to a precious metal reclaimer in Arezzo, Italy [Chimet S.P.A.]. Attachment IV documents that Metalor’s sweeps are being reclaimed in Italy to recover economically significant amounts of precious metal (e.g., Metalor’s precious metal-bearing waste is exempted from hazardous waste regulation per 40 C.F.R. 266 Subpart F).
- ➔ Other facts relayed by Mr. Tatakis:
 - Metalor started at this location in June 1984 and Mr. Tatakis is the only environmental person;
 - Metalor operates 24 hours per day, 3 shifts per day. All shifts are guarded. There are currently about 80-90 employees;
 - Metalor’s principle customers are the electronics and jewelry industries, and precious metal mines;
 - Mr. Ken Beilstein is Metalor’s new General Manager [in position for approximately 4 months];
 - The Maintenance Department is gradually shifting to latex paints;
 - Metalor is permitted to bring in precious metal plating solutions, but generally does not accept much since the Facility is not a competitive refiner of this material;
 - Metalor uses plating baths for plating out precious metals used to produce gold and silver salts, gold and silver bullion, and cyanide salts;
 - Plating of gold utilizes hydrochloric acid. Plating of silver utilizes nitric acid and sugar. The plating process results in the generation of an industrial wastewater (bearing trace metals) which is eventually discharged to the local POTW;
 - The segregation of gold and silver results in a silver bearing slag. This slag passes through a copper recovery process which removes the copper and helps to further refine the silver.

³ Sweeps correspond to bag house dust, floor sweeping, incinerator ashes.

- Copper is sent off-site for reclamation;
 - Some wastewater is also generated at the end of closed-loop processes and from the ultra-filtration/de-ionization units;
 - Spent ultra-filtration/de-ionization media is returned to the manufacturer under contract;
 - There is only one satellite accumulation area [SAA] on premises that is used to collect maintenance oils, degreasers and glycols;
 - Metalor recently purged universal wastes from the premises;
 - None of the sweeps shipped off-site for further recovery of precious metals were ever returned to Metalor for failure to meet the receiving facility's minimum acceptance criteria; and
 - The most recent Clean Air Act inspection at Metalor occurred approximately two years ago.
- ➔ Metalor's expended materials which are potentially contaminated with precious metals are reduced in one of three incinerators [Atlas, United and Consumat]. The Atlas incinerator burns miscellaneous waste material such as rubber gloves and clothing. The United incinerator burns sugar sludges and copper-bearing residue, and the Consumat (crematorium) incinerator burns spent tools, buckets, drums, plastics and domestic refuse. As mentioned above, this material and sweeps are sent to either Italy or Canada for precious metal reclamation. [During the tour of the Facility, EPA observed four 55-gallon drums of sweeps next to the Consumat incinerator awaiting shipment.]

FACILITY TOUR starting at 11:15 a.m. [as accompanied by Mr. Tatakis]

- ➔ Security Procedure: Mr. Tatakis informed the EPA inspectors that they would first have to go through a security screening prior to entering, and upon leaving, the production floor. The inspectors were informed that cameras were not allowed into the production area. [Mr. Tatakis said he would take pictures of anything that the inspectors were interested in and would provide EPA with prints if necessary. EPA inspectors did not request photographs of any observations made during the inspection.]
- ➔ The next area inspected was the Loading Dock Area, which consisted of two large bays. This area receives all the incoming material that will undergo precious metal recovery at Metalor. EPA inspectors observed approximately 150 (55-gallon) drums of silver chloride inventory awaiting silver recovery. Mr. Tatakis informed EPA that all inventory drums are checked by staff for consistency with billing and shipping labels. EPA also observed thirty-three 55-gallon drums of blended sweeps in storage on the loading dock awaiting off-site reclamation. There were also several drums of copper hydroxide sludge staged in separate areas of the loading dock awaiting off-site reclamation.
- ➔ All solids received as inventory at the loading dock are sent to the Vault Room, where the weights and composition of the stock are verified against shipping papers prior to heading to the recovery processes.
- ➔ All liquids received as inventory bypass the Vault Room and proceed directly to the recovery processes.
- ➔ The next area inspected was the Miller Furnace discussed above. The furnace is equipped with Venturi Scrubbers followed by wet electrostatic precipitation. The floor sump in the pour-off area of the Miller Furnace receives liquid from the electrostatic precipitator which is eventually reintroduced to the furnace. All debris and residue removed from the furnace goes into a stainless steel ball mill where it is pulverized. The resultant powder is screened for removal of metal

fragments and the residual powder [consisting of 2/3 silica and 1/3 residual iron, copper and trace precious metals] is drummed and shipped off-site to Italy or Canada for precious metal recovery.

→ The next areas inspected were the:

1. Atlas, United and Consumat incinerators (discussed above);
2. Miller Leach Area: Processes observed here were precious metals recovery units consisting of gold and silver electroplating lines [electro-refining cells], and the industrial WWTF. There are three silver electro-refining cells and one gold electro-refining cell. Wastewater generated from the electro refining cells eventually discharges to Metalor's WWTF;
3. Gold potassium cyanide area which produces gold for the jewelry industry;
4. Cyanide treatment area (cyanide destruct area). All cyanide wastes are treated with chlorine bleach and discharged to the wastewater treatment plant;
5. Silver potassium cyanide production area which produces silver for the electronics and jewelry industries;
6. Gold products laboratory (which verifies the purity of both incoming and final product); and
7. The WWTF covered by the Industrial User Permit of Attachment II. [The WWTF consists of an elementary neutralization tank, followed by ultra-filtration and ion exchange units with subsequent discharge to the local POTW. EPA did observe at least two 55-gallon drums labeled as lead contaminated wastewater slated for treatment in the WWTF. EPA inspectors informed Mr. Tatakis that once wastewater is containerized and removed from the WWTF collection system or treatment units it loses the RCRA exemption for wastewater units and must, therefore, be managed as a hazardous waste. Neither container of waste water was marked with the words "hazardous waste," nor with the beginning accumulation date.

The materials generated in process areas described in items one through five (above) correspond either to: precious metal products; solid residuals which are either further refined on-site to recover metal content or shipped off-site for metal recovery; or liquid residuals which either are continuously recycled, treated for metal recovery, or treated and discharged through the facility's WWTF.

On a regular basis [approximately once every 18 months], Metalor may gather and manage hazardous wastes consisting of off-specification chemical inventory from the Gold Products Laboratory located on the second floor [item 6, above].

→ The next area observed was the Maintenance Area. It was in this area that EPA observed the only satellite accumulation area [SAA] container at Metalor. The SAA consisted of an open, 55-gallon drum labeled as follows: "Hazardous Waste, Regulated Oil Waste, MA01, Toxic." Mr. Tatakis stated that this waste was destined for off-site incineration. The floor immediately around the SAA was delineated with marking tape. When EPA pointed out the open bung while material was not being added to or removed from the drum, Mr. Tatakis immediately closed it.

EPA also examined several paint (cans and aerosols) and supply cabinets in the Maintenance Area. Mr. Tatakis stated that these materials are usually used to completion and did not generate a waste stream. In fact, EPA inspectors did not find any of these materials either disposed of in domestic trash, managed as hazardous waste or stockpiled for on-site incineration. EPA inspectors recommended that Mr. Tatakis carefully review product information such as MSDSs and container labeling prior to disposing of any of these products in domestic trash or on-site incinerators since individual constituents could classify such wastes as characteristic or listed hazardous wastes. Some of the supplies observed by EPA were: adhesives, pails of black top, solvent cement, urethane

paints, and enamels.

- ➔ At approximately 12:05 p.m. Mr. David Kinneberg [Plant Manager and Vice President of Production] briefly joined the EPA inspectors and Mr. Tataakis. He asked the EPA inspectors if they were receiving all the assistance they needed during the inspection. Inspector Nachmann stated that Mr. Tataakis had assisted EPA during the opening conference and the facility tour (which was just about to conclude), and that after lunch EPA would conduct a records review followed by an inspection exit interview. Mr. Kinneberg was invited to participate in the exit interview.
- ➔ At 1:05 p.m. EPA inspectors halted the inspection for lunch. The inspection resumed at 2:05 p.m. with a records review.

Records Review (assisted by Mr. Tataakis and Mr. Kinneberg)

- ➔ In preparation for the records review, Mr. Tataakis and Mr. Kinneberg had gathered the last three years of Metalor's sweeps shipping files. EPA inspectors reviewed several of these files and observed that the record keeping format was very consistent from shipment to shipment. In order to understand exactly what these shipping papers represented, EPA asked for a copy of a complete set of documents corresponding to one randomly selected shipment that would exemplify the process of handling precious metal bearing sweeps. Specifically, the inspectors requested copies of all documents that would identify the material shipped, how much of it was shipped and to whom, and what economically significant value was assigned to the recovered precious metal. This example is provided in Attachment IV.
- ➔ EPA then reviewed two MADEP Recycling Permits. The first [Class A] permit had an effective date of 9/13/04 and an expiring date of 9/13/09. This permit authorizes the recycling of 500,000 pounds per year of characteristic [D002] hazardous sludges.

The second [Class B(4)] permit also had an effective date of 9/24/04 and an expiring date of 9/29/09. This permit authorizes the following recycling:

characteristic sludges	D001, D002, D011	500,000 #/yr
characteristic solutions	D001, D002	500,000 #/yr
metal sweeps	D011, D008	500,000 #/yr
spent plating and cleaning bath solutions	F007, F008, F009	500,000 #/yr
spent halogenated solvents	F001, F002	5000 #/yr
spent non-halogenated solvent's	F003, F004, F005	5000 #/yr
spent wastewater treatment sludges from electro-plating containing CN	F006, D003	1M#/yr ⁴

⁴Permit states that "This material is authorized for transfer, but not authorized for recycling at this facility without modification of the permit." Mr. Tataakis stated that this is a waste stream that Metalor wanted to be able to take as a service to a particular customer, and that Metalor does not have the capacity to recycle it at present. Metalor has not taken in any of this material as stock for reclamation.

→ EPA then conducted a Manifest Review for calendar years 2003 through 2005. All manifests records were complete, appropriately signed and dated, delivered to the designated facility in a timely fashion, and had appropriate accompanying Land Disposal Restriction Notices. The hazardous wastes listed on the manifests reviewed by EPA were as follows:

1. lead oxide, D008, D011;
2. pyridene/methanol, F003/D001;
3. glacial acetic acid, oleic acid, D002, D001;
4. waste hydrazine hydrate, D003, D001;
5. Ammonia nitrate, D001;
6. Ammonia sulfide, D002;
7. Sodium sulfide, D001; and
8. Sodium boro-hydride and sodium hydroxide solution, D003, D002.

These wastes, and their amounts, correspond to the types of materials removed (as chemical waste and expired chemical inventory) from the Facility's Gold Products Laboratory.

→ **Inspection Exit Interview:** EPA inspectors conducted an Inspection Exit Interview in the presence of Mr. Tatakis and Mr. Kinneberg to review the findings listed above.

In general, the information gathered by EPA indicates that the only wastes manifested off-site as hazardous waste originate from the laboratory and from the Maintenance Area [waste oil and universal wastes]. All other shipments or discharges from Metalor appear to either meet the hazardous waste regulation exemption provided by 40 C.F.R. 266 Subpart F, or are covered by the Clean Water Act Industrial Pretreatment Program.

EPA explained that this inspection was targeted by EPA Headquarters in support of a national mineral processing initiative. The manifests, shipping papers and effective MADEP recycling permits reflect what was said by Mr. Tatakis during the opening conference and observed during the facility tour.

EPA reiterated that care should be taken prior to disposing of stock or waste from the Maintenance Area to prevent the disposal of characteristic and/or listed hazardous wastes into the regular trash or incinerated on premise. EPA explained that incineration on site of such wastes would be equivalent to the treatment of hazardous wastes without a MADEP permit.

Finally, EPA pointed out the two hazardous waste violations observed during the inspection, namely:

1. the sole SAA container of waste oil was found with an open bung; and
2. two 55-gallon drums of lead bearing wastewater located near Metalor's WWTF, should have been managed as a hazardous wastes and appropriately labeled as "Hazardous Waste", with words that fully describe the contents, and dated with the beginning accumulation date.

→ The EPA inspection team left the premise at 3:33 p.m. on July 28, 2005.